

What is claimed is:

1. A catheter shaft, comprising:

a proximal portion having about 80 to about 95 weight % polyoxymethylene and about 5 to about 20 weight % polyether polyester;

an intermediate portion coupled to the proximal portion, the intermediate portion having about 20 to about 50 weight % polyoxymethylene and about 50 to about 80 weight % polyether polyester; and

a distal portion coupled to the intermediate portion, the distal portion having about 5 to about 20 weight % polyoxymethylene and about 80 to about 95 weight % polyether polyester.

2. The catheter shaft according to claim 1, further comprising an inner polytetrafluoroethylene tubular member disposed within the polymer blend shaft.

3. The catheter shaft according to claim 2, further comprising a braided metallic support member disposed between the inner polytetrafluoroethylene tubular member and the polymer blend shaft.

4. The catheter shaft according to claim 1, wherein the proximal portion, intermediate portion and distal portion define a total shaft length and the proximal portion is about 60 to about 90% of the total length, the intermediate portion is about 15 to about 20% of the total length, and the distal portion is about 2 to about 7% of the total length.

5. The catheter shaft according to claim 1, further comprising a distal tip coupled to the distal portion of the catheter shaft.

6. The catheter shaft according to claim 5, wherein the distal tip is comprised of polyether polyester.

7. A catheter shaft comprising:

a polymer blend shaft that includes a blend of polyoxymethylene with polyether polyester, the polymer blend shaft including a proximal portion having a flexural modulus of about 210 to about 380 ksi, an intermediate portion having a flexural modulus of about 30 to about 90 ksi, and a distal portion having a flexural modulus of less than about 30 ksi, wherein the intermediate portion is disposed between the proximal portion and the distal portion.

8. The catheter shaft according to claim 7, further comprising an inner polytetrafluoroethylene tubular member disposed within the polymer blend shaft.

9. The catheter shaft according to claim 8, further comprising a braided metallic support member disposed between the inner polytetrafluoroethylene tubular member and the polymer blend shaft.

10. The catheter shaft according to claim 8, wherein the proximal portion, intermediate portion and distal portion define a total shaft length and the proximal portion

is about 60 to about 90% of the total length, the intermediate portion is about 15 to about 20% of the total length, and the distal portion is about 2 to about 7% of the total length.

11. The catheter shaft according to claim 8, wherein the proximal portion includes about 80 to about 95 weight % polyoxymethylene and about 5 to about 20 weight % polyether polyester, the intermediate portion includes about 20 to about 50 weight % polyoxymethylene and about 50 to about 80 weight % polyether polyester, and the distal portion includes about 5 to about 20 weight % polyoxymethylene and about 80 to about 95 weight % polyether polyester.

12. A catheter shaft, comprising:

an inner layer;

a support member disposed over the inner layer; and

an outer layer disposed over the inner tubular member, the outer layer including a proximal portion having about 80 to about 95 weight % polyoxymethylene and about 5 to about 20 weight % polyether polyester, an intermediate portion having about 20 to about 50 weight % polyoxymethylene and about 50 to about 80 weight % polyether polyester, and a distal portion having about 5 to about 20 weight % polyoxymethylene and about 80 to about 95 weight % polyether polyester, wherein the intermediate portion is disposed between the proximal portion and the distal portion.

13. The catheter shaft according to claim 12, wherein the inner layer comprises polytetrafluoroethylene.

14. The catheter shaft according to claim 12, wherein the inner layer comprises high-density polyethylene.

15. The catheter shaft according to claim 12, wherein the support member includes a braid.

16. The catheter shaft according to claim 12, wherein the support member includes a coil.

17. The catheter shaft according to claim 12, further comprising a distal tip coupled to and disposed distally of the inner layer, outer layer, and support member.

18. The catheter shaft according to claim 17, wherein the distal tip is comprised of polyether polyester.

19. A balloon catheter comprising:

an inner tubular member;

an outer tubular member disposed over the inner tubular member, the outer tubular member including a proximal portion having about 80 to about 95 weight % polyoxymethylene and about 5 to about 20 weight % polyether polyester, an intermediate portion having about 20 to about 50 weight % polyoxymethylene and about 50 to about 80 weight % polyether polyester, and a distal portion having about 5 to about 20 weight

% polyoxymethylene and about 80 to about 95 weight % polyether polyester, wherein the intermediate portion is disposed between the proximal portion and the distal portion; and  
a balloon coupled to the distal portion of the outer tubular member.

20. The balloon catheter according to claim 19, wherein the inner tubular member comprises polytetrafluoroethylene.

21. The balloon catheter according to claim 19, wherein the inner tubular member comprises high-density polyethylene.

22. The balloon catheter according to claim 19, wherein the inner tubular member defines a guidewire lumen extending therethrough.

23. The balloon catheter according to claim 19, wherein an inflation lumen is defined between the inner tubular member and the outer tubular member.

24. A catheter shaft, comprising:  
a polymer blend proximal section;  
a polymer blend distal section having a material composition different from the proximal section;  
a polymer blend intermediate section disposed between the proximal section and the distal section, the intermediate section having a material composition different from both the proximal section and the distal section; and

wherein the proximal section, the distal section, and the intermediate section each include polyoxymethylene blended with a polymer having an ether group.

25. A catheter shaft, comprising:

a proximal section including about 80 to about 95 weight % polyoxymethylene;

an intermediate section coupled to the proximal section, the intermediate section including about 20 to about 50 weight % polyoxymethylene;

a distal section coupled to the intermediate section, the distal section having about 5 to about 20 weight % polyoxymethylene; and

wherein the proximal section, intermediate section, and distal section each include polyether polyester.

26. A method for manufacturing a catheter shaft, comprising the steps of:

providing a first polymer blend having about 80 to about 95 weight % polyoxymethylene and about 5 to about 20 weight % polyether polyester;

providing a second polymer blend having about 20 to about 50 weight % polyoxymethylene and about 50 to about 80 weight % polyether polyester; and

providing a third polymer blend having about 5 to about 20 weight % polyoxymethylene and about 80 to about 95 weight % polyether polyester;

extruding the first polymer blend to define a first shaft member;

extruding the second polymer blend to define a second shaft member;

extruding the third polymer blend to define a third shaft member; and

coupling the first shaft member, second shaft member, and third shaft member to define a catheter shaft.

27. A method for manufacturing a catheter shaft, comprising the steps of:

providing a first quantity of polyoxymethylene;

providing a second quantity of polyether polyester;

co-extruding the first quantity of polyoxymethylene with the second quantity of polyether polyester to define a proximal shaft portion having about 80 to about 95 weight % polyoxymethylene and about 5 to about 20 weight % polyether polyester, an intermediate shaft portion having about 20 to about 50 weight % polyoxymethylene and about 50 to about 80 weight % polyether polyester, and a distal shaft portion having about 5 to about 20 weight % polyoxymethylene and about 80 to about 95 weight % polyether polyester.